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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/062,413	02/05/2002	Morikawa Takeshi	219110US0CONT	3356

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EXAMINER

JOHNSON, EDWARD M

ART UNIT	PAPER NUMBER
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1754

DATE MAILED: 03/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/062,413

Applicant(s)

TAKESHI ET AL.

Examiner

Edward M. Johnson

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 31 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-52 is/are pending in the application.
- 4a) Of the above claim(s) 24-48 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6, 10, 11, 15-23 and 49-52 is/are rejected.
- 7) ☒ Claim(s) 7-9 and 12-14 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 2,10/02;7,12/03.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

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**DETAILED ACTION**

***Election/Restrictions***

1. Applicant's election with traverse of Group I, claims 1-23 and 49-52 is acknowledged. The traversal is on the ground(s) that Applicants disagree with the Examiner's... still needs to be considered. This is not found persuasive because Applicant's alleged "inventive link" does not provide a contribution over the prior art, as set forth in the specifics of the restriction requirement. Applicant does not appear to respond to those specifics except simply to say that he "disagrees", which, without further support, is not found persuasive.

The requirement is still deemed proper and is therefore made FINAL.

***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 10-11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

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Claim 10, "the X-ray photoemission spectroscopy spectrum" lacks antecedent basis.

Claim 11, "the C axis" lacks antecedent basis.

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1, 3-6, 10-11, 15-17, and 49-50 are rejected under 35 U.S.C. 102(b) as being anticipated by Boire et al. WO97/32823 (and English translation in US 5,939,201).

Regarding claims 1, 15, Boire '201 discloses well-crystallized photocatalyst comprising titanium oxynitride, which inherently contains nitrogen atoms and chemical bonds between the elements thereof (see column 7, lines 47-49 and 66-67).

When the examiner has reason to believe that the functional language asserted to be critical for establishing novelty in

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claimed subject matter may in fact be an inherent characteristic of the prior art, the burden of proof is shifted to Applicant to prove that the subject matter shown in the prior art does not possess the characteristics relied upon. In re Fitzgerald et al. 205 USPQ 594.

Regarding claims 3, 5-6, and 10-11 Boire '201 discloses crystallized titanium oxynitride compound and an amine or ammonia (see claim 10), which inherently comprises a crystal face, chemical bonds, and a shell bond energy spectra and peaks corresponding to such a compound.

Regarding claim 4, Boire '201 discloses titanium oxynitride compound, which inherently comprises chemical bonds.

Regarding claims 16-17 and 49-50, Boire '201 discloses silica internal layer for the titanium oxynitride photocatalyst (see column 9, lines 20-24) and a glass plate substrate, which is the same as an island form.

6. Claims 1, 3-6, 10-11, 15-23, and 49-50 rejected under 35 U.S.C. 102(e) as being anticipated by Yadav et al. US 6,344,271.

Regarding claims 1 and 15, Yadav '271 discloses titanium photocatalytic crystals (see column comprising titanium oxynitride (see column 3, lines 60-62) wherein the nitrogen is introduced by lattice diffusion (see column 16, lines 55-59).

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Regarding claims 6, 10-11, Yadav '271 discloses titanium oxynitride, TiN and ammonia treatment (see column 3, lines 60-62 and Example 4) produced by lattice diffusion (see column 16, lines 55-59), which inherently comprises a crystal face, chemical bonds, and a shell bond energy spectra and peaks corresponding to such a compound.

Regarding claims 15-23 and 49-50, Yadav '271 discloses alumina substrate on a mesh form or glass (see Examples 2 and 6) or a wire or plate, which would be the same shape as a needle or island (see column 15, lines 35-38).

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claim 2 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Boire '201.

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Regarding claim 2, Boire '201 discloses well crystallized photocatalyst comprising titanium oxynitride, which inherently contains nitrogen atoms (see column 7, lines 47-49 and 66-67).

9. Claim 2 is rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Yadav '271.

Yadav '271 discloses titanium photocatalytic crystals (see column comprising titanium oxynitride (see column 3, lines 60-62) wherein the nitrogen is introduced by lattice diffusion (see column 16, lines 55-59).

In the event any differences can be shown for the product of the product-by-process claim 2, as opposed to the product taught by Bruno '239, such differences would have been obvious to one of ordinary skill in the art at the time the invention was made as a routine modification of the product in the absence of a showing of unexpected results; see also In re Thorpe, 227 USPQ 964 (Fed.Cir. 1985).

10. Claims 18-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boire '201.

Regarding claims 18-23, Boire fails to disclose an island, needle, or mesh.

It is considered that it would have been obvious to one of ordinary skill in the art at the time the invention was made to

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use island, needle, and/or mesh forms because Boire discloses glass plates, ribbons, and pulverulent forms, as well as other possible variations (see paragraph bridging columns 1-2), which would obviously, to one of ordinary skill, suggest other forms including needle and mesh.

11. Claims 51-52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boire '201 as applied to claim 49 above, and further in view of Takaoka et al. US 5,670,247.

Boire '201 fails to disclose zeolite or activated carbon.

Takaoka '247 discloses zeolite or active carbon (see column 5, lines 58-65).

It is considered that it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the zeolite or active carbon of Takaoka in the photocatalyst carrier of Boire because Takaoka disclose his zeolite and carbon as examples of carrier used for a photoreactive composition to prevent leakage and deactivation can be considerably inhibited (see column 5, lines 50-58).

12. Claims 51-52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yadav '271 as applied to claim 49 above, and further in view of Takaoka '247.

Yadav '271 fails to disclose zeolite or activated carbon.



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Takaoka '247 discloses zeolite or active carbon (see column 5, lines 58-65).

It is considered that it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the zeolite or active carbon of Takaoka in the photocatalyst carrier of Yadav because Takaoka disclose his zeolite and carbon as examples of carrier used for a photoreactive composition to prevent leakage and deactivation can be considerably inhibited (see column 5, lines 50-58).

***Allowable Subject Matter***

13. Claims 7-9 and 12-14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

14. The following is a statement of reasons for the indication of allowable subject matter: The photocatalytic material having a nitrogen atom substituted between a band gap of a valence band and a conduction band of titanium oxide of the instant claim 7; having a nitrogen content percentage as set forth in the photocatalytic materials of the instant claims 8-9; or the photocatalytic material having the formulas set forth in the instant claims 12-14; all would not have been obvious to one of ordinary skill in the art at the time the invention was made.

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**Conclusion**

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Simmons, Jr. et al. US 6,154,311 discloses titania photocatalytic crystals (see column 1, lines 65-67 and column 3, lines 5-13) comprising titanium in the oxynitride form (see column 6, lines 18-26).

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edward M. Johnson whose telephone number is 571-272-1352. The examiner can normally be reached on M-F 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley S. Silverman can be reached on 571-272-1358. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

  
STANLEY S. SILVERMAN  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 1700

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

EMJ